

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TEXARKANA DIVISION**

MAXELL, LTD.,	§	
	§	
Plaintiff,	§	
	§	
v.	§	Civil Action No. 5:24-CV-88-RWS-JBB
	§	
CORETRONIC CORP. AND OPTOMA CORP.	§	
	§	
Defendants.	§	

CLAIM CONSTRUCTION MEMORANDUM OPINION AND ORDER

Maxell, Ltd. (“Maxell”) alleges infringement by Coretronic Corp. and Optoma Corp. (together, “Defendants”) of claims from seven patents: U.S. Patent Nos. 7,159,988 (the “’988 Patent”); 7,850,313 (the “’313 Patent”); 8,593,580 (the “’580 Patent”); 9,322,530 (the “’530 Patent”); 9,547,226 (the “’226 Patent”); 9,565,388 (the “’388 Patent”); and 9,900,569 (the “’569 Patent”). The parties dispute the scope of eight terms and phrases from four of the seven patents-in-suit (’988, ’580, ’226, and ’388 Patents). Having considered the arguments and evidence presented by the parties at the May 9, 2025 hearing and in their claim construction briefing, the Court issues this Claim Construction Order.

I. LEGAL STANDARDS

A. Generally

“[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). As such, if the parties dispute the scope of the claims, the court must determine their meaning. *See, e.g., Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1317 (Fed. Cir. 2007) (Gajarsa, J.,

concurring in part); *see also Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996), *aff'g*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc).

When construing claims, “[t]here is a heavy presumption that claim terms are to be given their ordinary and customary meaning.” *Aventis Pharm. Inc. v. Amino Chems. Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013) (citing *Phillips*, 415 F.3d at 1312–13). Courts must therefore “look to the words of the claims themselves . . . to define the scope of the patented invention.” *Id.* (citations omitted). The “ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1313. This “person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

For certain claim terms, “the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” *Id.* at 1314. But for claim terms with less-apparent meanings, courts consider “those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean . . . [including] the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Id.*

B. Definiteness under 35 U.S.C. § 112 ¶ 2

“[I]ndefiniteness is a question of law and in effect part of claim construction.” *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517 (Fed. Cir. 2012); *Sonix Tech. Co. v. Publ’ns Int’l, Ltd.*,

844 F.3d 1370, 1377 (Fed. Cir. 2017). Patent claims must identify with specificity and claim distinctly the subject matter regarded as the invention. *CDN Innovations, L.L.C. v. Grande Commc 'ns Networks, L.L.C.*, No. 4:20-CV-653-SDJ, 2021 WL 3615908, at *6 (E.D. Tex. Aug. 13, 2021) (citing 35 U.S.C. § 112 ¶ 2). A claim, when viewed in light of the intrinsic evidence, must “inform those skilled in the art about the scope of the invention with reasonable certainty.” *Id.* (quoting *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014)). If it does not, the claim fails § 112 ¶ 2 and is therefore invalid as indefinite. *Id.* (quoting *Nautilus*, 572 U.S. at 901). Whether a claim is indefinite is determined as of the time the application for the patent was filed. *Id.* (citing *Nautilus*, 572 U.S. at 911). As it is a challenge to the validity of a patent, the failure of any claim to comply with § 112 must be shown by clear and convincing evidence. *Id.* (citing *Nautilus*, 572 U.S. at 912 n.10).

C. Functional Claiming Under 35 U.S.C. § 112 ¶ 6

A § 112 ¶ 6 analysis consists of two steps. *Id.* (citing *Dyfan, L.L.C. v. Target Corp.*, 28 F.4th 1360, 1365 (Fed. Cir. 2022)). The first step is to determine whether a claim limitation is drafted in means-plus-function format such that § 112 ¶ 6 applies to the claim limitation. *See id.* In making that determination, the Federal Circuit has “long recognized the importance of the presence or absence of the word ‘means.’” *Id.* (quoting *Williamson v. Citrix Online, L.L.C.*, 792 F.3d 1339, 1348 (Fed. Cir. 2015)). In the absence of the word “means,” it is presumed that a claim limitation is not subject to § 112 ¶ 6. *Id.* The presumption stands or falls according to whether one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function. *Id.* (citing *Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (stating § 112 ¶ 6 does not apply when “the claim language, read in light of the specification, recites

sufficiently definite structure” (quotation marks omitted) (citing *Williamson*, 792 F.3d at 1349; *Robert Bosch, L.L.C. v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014)))).

If the limitation fails to recite sufficiently definite structure or acts, then § 112 ¶ 6 applies and the court moves to step two of the analysis. *Id.* At step two, the court determines whether the specification discloses structure or acts that “corresponds to the claimed function.” *Id.* (quoting *Williamson*, 792 F.3d at 1351). A “structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Id.* (quoting *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001)). If there is no identifiable “corresponding structure, material, or acts described in the specification,” the claim term is indefinite. *Id.* (citing *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1312 (Fed. Cir. 2012) (“[A] means-plus-function clause is indefinite if a person of ordinary skill in the art would be unable to recognize the structure in the specification and associate it with the corresponding function in the claim.”) (citations omitted in *SitePro*)).

II. THE LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the art is the skill level of a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In resolving the appropriate level of ordinary skill, courts consider the types of and solutions to problems encountered in the art, the speed of innovation, the sophistication of the technology, and the education of workers active in the field. *Id.* Importantly, “[a] person of ordinary skill in the art is also a person of ordinary creativity, not an automaton.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007). The parties propose similar, but distinct, levels of skill for the various patents. *See* Dkt. No. 84 at 3, 7, 17, 25; Dkt. No. 86 at 3. Both sides agree the Court need not resolve this dispute for the purposes of claim construction. Dkt. No. 105 at 14:11-24.

III. THE DISPUTED TERM FROM U.S. PATENT 7,159,988

A. Background

The '988 Patent is entitled "Projection Optical Unit and Projection Image Display Apparatus" and issued on January 9, 2007. At the time of the invention of the '988 Patent, which claims priority to November 28, 2003, it was well known that contemporaneous projection optical unit technology had various disadvantages. For example, certain prior solutions to realize a more compact projection unit required lens types (e.g., asymmetrical lenses) which were difficult to manufacture. '988 Patent at 1:32-53. As another example, achieving wider-angled imaging caused difficulties with focusing performance. *Id.* at 1:58-67.

Thus, there was a need to create a more compact projection display apparatus that would ensure "wider-angle imaging, higher focusing performance, higher magnifications, and longer back-focusing." *Id.* at 2:26-30. Additionally, it was desirable to minimize development investment by "partially modifying standard components without redesigning and redeveloping all illumination optics or the projection optical unit." *Id.* at 2:30-35.

The '988 Patent sought to create more compact and versatile projection display apparatuses without a wholesale redesign of the entire device. *Id.* at 2:26-39. To achieve this, the '988 Patent discloses a specialized configuration with particular positioning and properties for a first projection optical unit and a second projection optical unit. *Id.* at 2:40-52.

For example, in certain embodiments, the second projection optical unit is positioned such that it further enlarges a first enlarged image obtained by the first projection optical unit. *Id.* Further, the '988 Patent discloses a configuration in which the first projection optical unit includes an aperture stop that defines an F-value of an entire projection optical unit that includes the first projection optical unit and the second projection optical unit. *Id.* at 26:59-27:3.

This configuration allows for changes in optical properties that “provid[e] an advantage in implementing very-wide-angle imaging” and provide images that “does not affect the on-screen enlarged image, even if dirt sticks to the field lens group.” *Id.* at 2:61-3:10. The wide-angle-imaging capabilities allow for a more compact projection display apparatus and greater versatility in placement of the projection display apparatus for viewing purposes because the “apparatus is not restricted by its installation location when used ... in a small room.” *Id.* at 3:49-54.

From this patent, the parties dispute only whether the following terms in claims 1, 7, and 8 should be construed as means-plus-function terms according to 35 U.S.C. § 112 ¶ 6¹: “projection optical unit” / “a first projection optical unit” / “a second projection optical unit.” Claim 1 recites:

1. A projection optical unit for enlarged projection of an image displayed by an image display element, comprising:

a first projection optical unit for forming a first enlarged image, said first projection optical unit having positive refractive power; and

a second projection optical unit positioned at an enlarged image side of said first projection optical unit in order to form a second enlarged image by further enlarging the first enlarged image obtained by said first projection optical unit, said second projection optical unit having positive refractive power;

wherein the first enlarged image is formed at the image display element side, rather than at said second projection optical unit,

a magnification M1 of the first enlarged image is smaller than a magnification M2 of the second enlarged image, and

said first projection optical unit includes an aperture stop that defines an F-value of said entire projection optical unit.

¹ Consistent with the briefing, this order refers to pre-AIA version of the statute.

Id. at 28:39–60.

Claim 7 recites:

7. A projection image display apparatus, comprising:
- an image display element; and
- a projection optical unit for projecting, in an enlarged form and onto a projection screen, an image displayed by said image display element, wherein said projection optical unit includes
- a first projection optical unit and a second projection optical unit, both arranged on an optical path ranging from said image display element to the screen,
- said first projection optical unit being adapted to form a first enlarged image and having positive refractive power, and
- said second projection optical unit being positioned at an enlarged image side of said first projection optical unit, being adapted to form a second enlarged image by further enlarging the first enlarged image obtained by said first projection optical unit, and having positive refractive power;
- wherein the first enlarged image is formed at the image display element side, rather than at said second projection optical unit,
- a magnification M_1 of the first enlarged image is smaller than a magnification M_2 of the second enlarged image, and
- said first projection optical unit includes an aperture stop that defines an F-value of said entire projection optical unit.

Id. at 29:13–30:15.

Claim 8 recites:

8. The projection image display apparatus according to claim 7, wherein an optical-axis center of said projection optical unit is

made eccentric with respect to a center of the screen.

Id. at 30:16-19.

B. “projection optical unit” / “a first projection optical unit” / “a second projection optical unit” (’988 Patent, Claims 1, 7, 8)

Maxell’s Construction	Defendants’ Construction
Plain and ordinary meaning, for example, an assembly of lenses, mirrors, and/or other optical elements to form an enlarged image	Governed by pre-AIA 35 U.S.C. § 112, ¶ 6 <u>Function</u> : to form an enlarged image <u>Structure</u> : a lens group having a positive refractive power

Maxell argues “projection optical unit” (and the similar terms above) are not means-plus-function limitations. According to Maxell, a plain-meaning construction that flows from the examples given in the specification, as proposed by Maxell, is the proper construction. Dkt. No. 84 at 5. Defendants respond that the term “unit” is a “well-known nonce term that connotes no structure,” and “the claim language as a whole recites a function without describing any structure(s) to perform that function.” Dkt. No. 86 at 3. Therefore, according to Defendants, even though the disputed terms do not use the word “means,” they are nonetheless properly construed as means-plus-function limitations, and the corresponding structure is found in column 7 of the ’988 Patent, describing the embodiment of Figure 1. *Id.* at 5-6 (citing ’988 Patent 7:6-14).

Whether “projection optical unit” is a means-plus-function limitation

Despite Defendant’s argument to the contrary, the claims provide structure for the projection optical units. For example, the projection optical units must have a “positive refractive index,” the first projection optical unit must have “an aperture stop that defines an F-value of said entire projection optical unit,” and the claims specify the spatial location of the first and second projection optical units to form the enlarged image. Such structure removes this term from the realm of

§ 112 ¶ 6. *Williamson*, 792 F.3d at 1349.

The intrinsic evidence is also informative of this dispute. Defendants assert the corresponding structure of optical units are lens groups, *without* other optical elements such as mirrors or prisms. Dkt. No. 86 at 5-6. However, consistent with the understanding of the term “unit,” the specification certainly suggests that prisms can be part of an optical group that contains lenses. Column 3 provides that “optical path folding means [i.e., a prism] is provided between the lens elements that constitute the [first/second] projection optical unit.” ’988 Pat. at 3:19-24. A fair reading of this passage shows that the optional prism can be added to the projection optical unit, meaning the claim term “unit” is not coextensive with “lens group” as Defendants’ construction suggests, and further supports the conclusion that “projection optical unit” connotes structure.

Finally, because the claims do not recite the word “means,” a rebuttable presumption arises that § 112 ¶ 6 does not apply. *Canon, Inc. v. TCL Elecs. Holdings Ltd.*, No. 2:18-CV-546-JRG, 2020 WL 2098197, at *25 (E.D. Tex. May 1, 2020) (citing *Williamson*, 792 F.3d at 1349). Given the claim connotes some structure, the rebuttable presumption becomes determinative absent compelling evidence to the contrary. *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1373 (Fed. Cir. 2003). Defendants have failed to provide such evidence; therefore, the presumption stands.

For the above reasons, this term is not governed by § 112 ¶ 6 and should instead be construed according to its plain and ordinary meaning. Further, there is no reason for a negative limitation that excludes or requires certain optical elements (such as lenses, mirrors, or prisms) from the optical units.² Given these rulings, there is no need for Maxell’s exemplary language (“for example, an assembly of lenses, mirrors, and/or other optical elements to form an enlarged image”)

² The remainder of the claim language, including the requirement that the projection optical units have “a positive refraction index” will naturally need to be met for infringement purposes.

to be included in the construction.

IV. THE DISPUTED TERMS FROM U.S. PATENT 8,593,580

A. Background

The '580 Patent is entitled "Projection-type Display Apparatus" and issued on November 26, 2013. The '580 Patent, which claims priority to February 5, 2010, is directed to solving the problem of diminishing lifetime of high-pressure mercury lamps when used as the light source device. *See, e.g.*, '580 Pat. at 2:17-23. Around the time of the invention of the '580 Patent, conventional projectors substituted solid-state light sources for mercury lamps, but these devices lacked a point-like light source of white color light with the necessary amount of intensity. *Id.* at 2:44-61. This made devices at the time ill-suited to users' needs.

With these shortcomings in mind, the inventors of the '580 Patent set out to solve this problem. The result of these efforts, disclosed in the '580 Patent, improves conventional devices by detailing a projection-type display apparatus with a solid-state light source (*e.g.*, LEDs and lasers) capable of generating sufficient power to prevent performance deterioration (*e.g.*, white-balance and/or color shading). *Id.* Conventional devices failed because they employed "a large number" of light sources "within a relatively large area," which could not build up a point-like light source of white color light having a necessary amount or intensity of lights. *Id.* at 2:46-55. Thus, the '580 Patent's inventors developed a system using nearly point-like solid state light sources having sufficient power to resolve these issues. *Id.* at Abstract, 2:44-61.

The parties dispute the meaning of the three terms below.

B. "light separation optic system" ('580 Patent, Claims 1, 10, 32)

Maxell's Construction	Defendants' Construction
Plain and ordinary meaning, for example, a collection	Governed by pre-AIA 35 U.S.C. §

<p>of one or more optic units configured to separate light into different colors</p>	<p>112, ¶ 6</p> <p><u>Function</u>: to separate white light from a light source configured to emit white lights including a light emitting from a fluorescent substance into blue-color light, green-color light, and red-color light</p> <p><u>Structure</u>: two (2) dichroic mirrors and one (1) reflection mirror statically oriented and positioned relative to each other as shown in Fig. 1, wherein dichroic mirror 31 reflects the blue light and transmits the green light and the red light, dichroic mirror 32 receives the separated light from dichroic mirror 31 and reflects the green light and transmits the red light, and reflection mirror 33 reflects the blue light reflected by dichroic mirror 31</p>
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Defendants argue the term “system” is a well-recognized nonce term. Dkt. No. 86 at 8, 10. According to Defendants, the modifier “light separation optic” imparts no structure, and the claim language only describes the function of the “light separation optic system,” not the structure thereof; thus, this term should be construed as a means-plus-function term. *Id.* at 8. Maxell argues Defendants never rebut the presumption that this term, which does not use “means,” is not subject to means-plus-function interpretation because a POSITA would understand “light separation optic system” to describe a specific class of structures, such as a collection of one or more optical components configured to separate light into different colors. Dkt. No. 84 at 8.

According to Maxell, courts have found “optic system” or substantially similar terms to connote sufficiently definite structure to a person of ordinary skill in the art. *Id.* at 8-9 (citing *Align*

Tech., Inc. v. 3Shape A/S., No. 17-1648-LPS, 2021 WL 2320139, at *9-10 (D. Del. June 7, 2021) (“optical system” “connote[s] sufficient structure to a person of ordinary skill in the art” and is not a means-plus-function term); *Magna Elecs., Inc. v. TRW Auto. Holdings Corp.*, No. 1:12-CV-654, 2015 WL 11401855, at *4 (W.D. Mich. Apr. 28, 2015) (“Optical system: Not a mean-plus-function claim under 35 U.S.C. § 112 ¶ 6. No construction needed.”); *Nikon Corp. v. ASM Lithography B.V.*, 308 F. Supp. 2d 1039, 1069 (N.D. Cal. 2004) (stating that “illumination optical system” was not subject to § 112 ¶ 6 because the term has “pre-established structural meaning” and is “well-understood to be a collection of mirrors, lenses, prisms, and the like configured to reflect, disperse, and otherwise act on light”). Maxell argues the addition of “light separation” to “optic system” is an additional “adjectival qualification[], which further identify sufficient structure to perform the claimed functions to one of ordinary skill in the art.” *Id.* at 9 (citing *Blitzsafe Texas, L.L.C. v. Subaru Corp.*, No. 2:17-CV-00421, 2018 WL 6504174, at *24 (E.D. Tex. Dec. 11, 2018)).

This situation calls for a similar result. Defendants do not put forth any expert testimony, and there is no argument that one of ordinary skill, under either party’s definition, would be unfamiliar with the structures used in an optical system to separate white light into its constituent parts. As shown in the text describing Figure 1, the specification supports the notion that “light separation optic system” is understood as having a particular structure. *See* Fig. 1, 5:31-35 (using two dichroic mirrors and a reflection mirror to change the direction of the optical path); *see also id.* at 1:50-59 (describing a prior art system that separates ultraviolet light into the red, green, and blue light rays). The use of optical elements (such as mirrors) to separate the white light is sufficient to remove this term—which does not use means—from the realm of § 112 ¶ 6.

Of note, even if this term were construed as a means-plus-function term, the scope would be very similar to the plain and ordinary meaning. That is, Defendants’ proposed corresponding

structure would be too narrow. As Maxell points out, Defendants' proposal requires a first dichroic mirror to reflect blue light and transmit green light and red light, a second dichroic mirror to receive separated light from the first dichroic mirror and to reflect green light and transmit red light, and a third (reflection) mirror to reflect blue light reflected by dichroic mirror. Incorporating structure from the written description beyond that necessary to perform the claimed function is improper. *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1352 (Fed. Cir. 2003). The "corresponding structure," if appropriate, would be optical components, which appears to be coextensive with Maxell's understanding of the plain and ordinary meaning (i.e., "collection of one or more optic units configured to separate light into different colors").

At the hearing, Defendants argued that the plain and ordinary meaning would include two dichroic mirrors and a reflection mirror, based on the disclosure in Figure 1. Dkt. No. 105 at 18:25-24. But "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction.'" *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (collecting cases rejecting the contention that if a patent describes a single embodiment, the claims must be construed as limited to that embodiment). The specification does not contain a manifest restriction that a light separation optic system must contain a specific number or type of mirrors.³

For this reason, this term is construed to have its plain and ordinary meaning, without the need for Plaintiffs' exemplary language.

³ At the hearing, Maxell identified other passages in the specification that disclose structures that can separate light. See Dkt. No. 105 at 5-25 (citing a prism in column 7 and a light separation optic system in Figure 5).

C. “light modulation means” (’580 Patent, Claims 1, 9, 10, 18, 32)

Maxell’s Construction	Defendants’ Construction
Governed by pre-AIA 35 U.S.C. § 112, ¶ 6 <u>Function</u> : making light-modulation on a respective one of the lights of the R, G and B separated, depending on a video signal <u>Structure</u> : image display element such as a liquid crystal panel or a digital mirror device, and equivalents thereof	Governed by pre-AIA 35 U.S.C. § 112, ¶ 6 <u>Function</u> : to change the intensity of each of the separated blue-color light, green-color light, and red-color light <u>Structure</u> : a set of three panels, one for each separated color light, each of which is a transmission-type liquid crystal panel, a reflection-type liquid crystal panel, or a digital mirror device made by aligning plural number of micro-mirrors

While the parties agree that “light modulation means” is a means-plus-function term, they disagree on both the function and structure. Regarding function, the dispute is whether modulation specifically requires changing the intensity and whether such modulation must occur on all three of the blue, green, and red components or just one of them. Regarding structure, the dispute centers on whether a single liquid crystal panel or three liquid crystal panels are required.

Starting with function, there is no need to replace “modulation” with “changing the intensity.” There is no dispute that modulation, in general, is broader than changing the intensity and can refer to changing other properties of light, such as changing amplitude, frequency, or phase. Defendants’ concern that constructions should aid the jury is well-founded, but there is no indication here that a jury would be misled or find confusing the term “modulation,” particularly where there does not seem to be a relevant dispute over how that term will be used by the experts. The true dispute is whether modulation must occur on “each of” the separate of the R, G, and B lights, as Defendants contend. The claim language provides the answer: “a light modulation means, configured to make light-modulation *on a respective one of the lights* of the R, G and B separated.”

This language clarifies that only one of the R, G, and B lights need be modulated.

Regarding structure, at the hearing, Maxell agreed that the language from the specification should be used as the corresponding structure. Dkt. No. 105 at 27-33. The complication is that this structure is sometimes referred to in the plural and sometimes in the singular. *See* '580 Patent at 3:42-49 (using the plural to describe “ transmission-type liquid crystal panels, or reflection-type liquid crystal panels, or digital mirror devices (DMD)”), 1:11-19 (using the singular to describe “a transmission-type or a reflection-type liquid crystal panel, or a digital mirror device (DMD)”); 2:40-43 (singular), 4:40-47 (singular). The plural version of this language appears to be a slight grammatical variation rather than a requirement for three panels. Using a construction that allows for a single panel is also consistent with the claimed function, which allows for modulating a single R, G, or B light. Accordingly, the Court will adopt the singular version of this language. *See also Playtex Prods., Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 909 (Fed. Cir. 2005) (holding it was appropriate for the court to look to the broader disclosure of the corresponding structure in the abstract rather than the more limiting disclosure in the drawings).

At the hearing, Defendants framed the dispute in a slightly different manner—whether a single panel can modulate all three colors as opposed to having one panel per light that is modulated. Dkt. No. 185 at 34:5-35:14. In other words, Defendants appear to contend that however many lights are modulated, you need a corresponding number of panels. At this point, it is unclear whether this is an infringement or a claim construction dispute, and this order does not address this issue.

For the above reasons, this term is construed according to 35 U.S.C. § 112 ¶ 6, with the function as “making light-modulation on a respective one of the lights of the R, G and B separated, depending on a video signal” and the corresponding structure as “a transmission-type or a

reflection-type liquid crystal panel, or a digital mirror device (DMD).”

D. “light flux capturing means” (’580 Patent, Claims 7, 37)

Maxell’s Construction	Defendants’ Construction
Governed by pre-AIA 35 U.S.C. § 112, ¶ 6	Governed by pre-AIA 35 U.S.C. § 112, ¶ 6
<u>Function</u> : capturing light flux	<u>Function</u> : to direct white light emitted from the light source
<u>Structure</u> : a lens, a mirror, or a combination of lenses and/or mirrors that captures at least some portion of light, and equivalents thereof	<u>Structure</u> : a reflection surface, such as a mirror, having a focus point

The parties’ dispute was minor and centered on whether construing “capturing light flux” would aid the jury and whether the structure should incorporate the later portion of the claim language concerning “reflective surface having a focal point.” At the hearing, the parties compromised and agreed that the function is “directing light” and the structure is a “reflection surface,” which is consistent with the preliminary constructions handed out just prior to the hearing.

V. THE DISPUTED TERMS FROM U.S. PATENT 9,547,226

A. Background

The ’226 Patent, with a priority date of November 1, 2012, is entitled “Light Source Device and Projection-type Image Display Device” and issued on January 17, 2017. The ’226 Patent addresses challenges associated with projection-type image display devices by introducing a light source device designed to improve the efficiency and lifespan of fluorescent materials. At the time, such devices concentrated excitation light on a small area of fluorescent material, leading to deterioration, reduced efficiency, and shortened lifespans of the fluorescent material, and consequently the lifespans of the light source device. *See* ’226 Patent at 1:34-38. Figures 6(A), 6(B), and 6(C) of the ’226 Patent illustrate these issues, showing how concentrated light resulted in uneven

luminance distribution, excessive heat in the center of the irradiation region, and decreased material performance.

To solve these problems, the inventors of the '226 Patent redesigned the optical components to optimize the distribution of excitation light on the fluorescent material. By increasing the irradiation region and creating a more uniform luminance distribution, as depicted in Figs. 1(B) and 1(C), the temperature of the fluorescent material is lowered. *See id.* at 2:66-3:9. This innovation not only improves light-emitting efficiency but also extends the lifespan of the fluorescent material and the overall light source device. *See id.* at 3:4-6, 3:60-4:23.

The parties dispute two terms in claim 8, which recites (terms emphasized in the limitation below):

8. A projection-type image display device comprising:
 - a light source device;
 - an image display element;
 - an illumination optical system having a plurality of optical elements for irradiating the image display element with light from the light source device; and
 - a projection lens for enlarging an optical image formed by the image display element to project the resulting image,wherein the light source device includes:
 - an excitation light source for emitting excitation light;
 - a fluorescent material for emitting fluorescent light when excited by the excitation light; and
 - an optical member for directing the excitation light to the fluorescent material, and

the optical member has a curvature that is set such that a light-

condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material,

a dichroic mirror disposed between the excitation light source and the fluorescent material; and

a condenser lens for condensing the excitation light disposed between the fluorescent material and the dichroic mirror,

wherein the optical member is disposed between the excitation light source and the dichroic mirror, and

wherein the optical member is a convex lens and a concave lens, with the convex lens and the concave lens being disposed in this order from the excitation light source toward the dichroic mirror.

Id. at 9:7–10:6.

B. “an emission side of the excitation light relative to the fluorescent material” (’226 Patent, Claim 8)

Maxell’s Construction	Defendants’ Construction
Not indefinite. Plain and ordinary meaning, for example, an excitation light’s exit side of the fluorescent material that faces away from the excitation light source	If the Court determines that this term is amenable to construction, then Defendants propose: The surface of the fluorescent material on the side facing the excitation light source.

C. “the optical member has a curvature that is set such that a light-condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material” (’226 Patent, Claim 8)

Maxell’s Construction	Defendants’ Construction
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Plain and ordinary meaning, for example, the optical member has a curvature that causes a light-condensing position of the excitation light to be positioned on an excitation light's exit side of the fluorescent material that faces away from the excitation light source	<p>If the Court determines that this term is amenable to construction, then Defendants propose that “a light-condensing position” be construed to mean:</p> <p>An illumination region formed by converging light rays</p>
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The first term above is part of the second term above, so these two terms are addressed together.

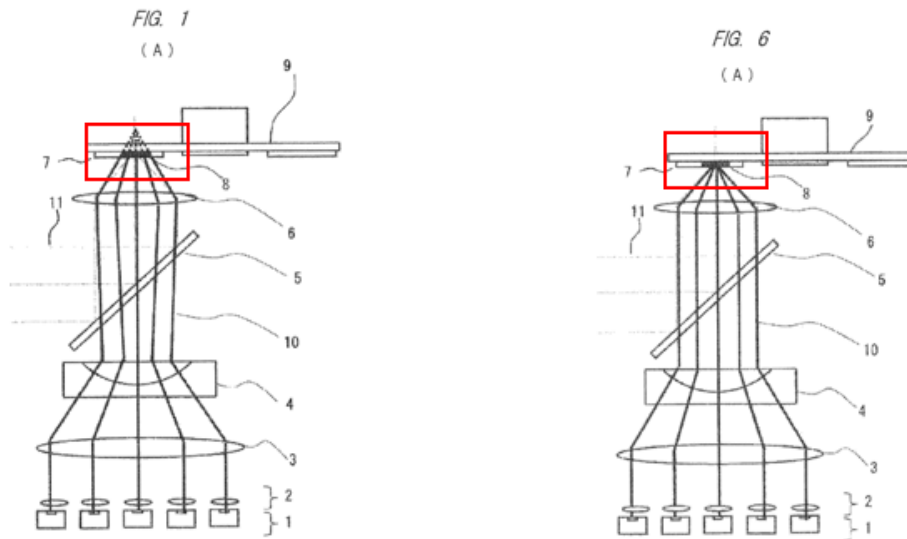
Defendants argue these disputed terms, as written, are nonsensical and must be found invalid because light itself does not and cannot emit anything; rather, it is a light source that emits light. Dkt. No. 86 at 19. Defendants’ alternative constructions reveal the two ultimate disputes between the parties: First, whether “an emission side of the excitation light relative to the fluorescent material” refers to the side of the fluorescent material that faces toward or away from the excitation light source. Second, whether “light-condensing position” refers to a point or a region.

As an initial matter, these terms are not indefinite. A claim, when viewed in light of the intrinsic evidence, must “inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014)). Dr. Michael Lebby provided a declaration with extensive reasoning to support his opinion that “a person of ordinary skill in the art reading the claim, in light of the specification and prosecution history, would understand the scope of the claimed subject matter with reasonable certainty.” Dkt. No. 84-4 at 14.⁴ Further, the analysis below shows that the patent is clearly describing and claiming a purported advancement over the prior art.

Moving on to the two disputes, the analysis starts with the intrinsic record. Claim 8,

⁴ There is no other expert countering Dr. Lebby’s opinions.

dependent claim 10, and the written description ('226 Patent, 3:45-51) use the disputed language to describe what is shown in Fig. 1a: that the excitation light 10 is made incident on the surface of the fluorescent material 7 such that the point the light would be condensed is moved farther past the other side of the fluorescent material 7, compared to the prior art system of Fig. 6. That is, the excitation light 10 makes a less focused distribution on the surface of the fluorescent material 7 compared to the prior art system in Fig. 6a. This is shown in the annotated figures below, where the red boxes show excitation light 10 is more condensed by the time it reaches the surface of the fluorescent material 7 in the prior art system of Fig. 6 compared to Fig. 1:



The patent explains that this defocusing of the excitation light makes the system more efficient and extends the life of the fluorescent material. In the prior art system, “the excitation light 10 irradiated onto the fluorescent material 7 forms a distribution like a laser luminance distribution,” which causes “extremely high” temperature at that point, resulting in “a reduction in light-emitting efficiency and a reduction in the service life of the fluorescent material.” ’226 Pat. at 2:59-3:3. The invention addresses this problem by “forming a substantially uniform luminance

distribution slightly defocused” as shown in Fig. 1, such that the “temperature rise in the center of the irradiation region 8 can be prevented, so that the light-emitting efficiency and service life of the fluorescent material can be improved.” ’226 Pat. 3:64-4:4.

To describe this “defocus[ing]”, the patent uses the following language :

Thus, the excitation light 10 that has passed through the condenser lens 6 is **made incident on the fluorescent material 7 at the front side of the fluorescent material 7 as a light-condensing position** (such that the light-condensing position is positioned on the emission side of the excitation light 10 relative to the fluorescent material 7).

’226 Pat. at 3:45-51. The underlined language is part of the disputed term found in claim 8, and the bold language appears in dependent claim 10.⁵

Thus, while the language “front side of the fluorescent material as a light-condensing position” and “light-condensing position is positioned on the emission side of the excitation light relative to the fluorescent material” is awkward, the patent uses this language to describe the defocusing of the excitation light on the incident surface of the fluorescent material—whether you call that the “front side,” “emission surface,” “side facing the excitation light source,” etc.

The parties appear to agree with this general concept, though they propose different constructions on how to get there. Maxell proposes plain and ordinary meaning with the understanding that the “emission side of the excitation light relative to the fluorescent material” should be understood as the “exit side of the fluorescent material that faces away from the excitation light source” and that “light-condensing position” refers to a point, not a region. Under this view, the claim describes the part of Figure 1 where the excitation light’s path would be condensed to a point some

⁵ Claim 10 depends from claim 8 and appears to correspond to the implementation of Fig.1’s embodiment described at ’226 Pat. 4:5-23 – which explains that the defocusing of the excitation light is specifically achieved by changing the positions and curvatures of either lens 3 or lens 4.

past the side of the fluorescence material facing away from the excitation light source (shown by the dashed lines conveying to a point in Figs. 1-4). Defendants alternatively contend that these terms should be understood as the excitation light is made incident on the side of the fluorescent material facing toward the excitation light source, with that light dispersed across an illumination region formed by converging light rays (shown by the spread out rays 10 as they hit region 8 in Figs. 1-4). Thus, both parties agree the claim describes the situation where the excitation light is defocused (i.e., it is still being condensed) at the point that it hits the fluorescent material's surface.

Given the possible confusion, a construction would be helpful for the jury, and Maxell's construction more clearly captures the difference between the invention of Fig. 1 and the prior art of Fig. 6. (Defendants' construction, while not without support, might lead to the incorrect argument that Fig. 6 falls within the claim scope.) Accordingly, the term "the optical member has a curvature that is set such that a light-condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material" is construed to mean "the optical member has a curvature that causes a light-condensing position of the excitation light to be positioned on an excitation light's exit side of the fluorescent material that faces away from the excitation light source." Under this construction, "light-condensing position" refers to the point the light is condensed on the side of the fluorescent material pointing away from excitation light source.

VI. THE DISPUTED TERMS FROM U.S. PATENT 9,565,388

A. Background

The '388 Patent is entitled "Video Display Device" and issued on February 7, 2017. The '388 Patent has a priority date of April 3, 2013, and is directed to improving visibility in video. '388 Patent at Abstract. The '388 Patent teaches that changing properties captured in video signals,

like luminance and color, can help improve video quality. *Id.* at 1:34-41. For example, adjusting contrast can provide better visibility of certain objects. *Id.* at 1:38-41.

However, conventional methods during the time of the '388 Patent did not properly account for the dynamic nature of videos. *Id.* at 1:42-48. For example, one scene in a video may require a first type of adjustment, and the next scene might require a different type of adjustment. *Id.* Then-existing methods did not account for differences in light-reflection properties and their contribution to the video when applying dynamic range compression. *Id.* at 1:4-54.

To solve this problem, the '388 Patent describes a system in which a set of processing units perform a series of specialized Retinex processes on video. *Id.* at Abstract. In this way, visibility of objects in videos may be increased and video quality may be improved. *Id.* at 2:8-9.

B. “Retinex processing unit” ('388 Patent, Claims 4, 6, 16, 18)

Maxell's Construction	Defendants' Construction
Not indefinite. Plain and ordinary meaning, for example, one or more processors that are capable of executing a Retinex process or one or more processors that are capable of executing a processing to control definition of a video and/or to control visibility of a video	Governed by 35 U.S.C. § 112(6) <u>Function</u> : perform a Retinex process <u>Structure</u> : None disclosed

The parties disagree whether the term “Retinex processing unit,” which is recited in claims 4, 6, 16, and 18, should be interpreted as a means-plus-function term, and if so, whether the term is indefinite for failing to be tied to corresponding structuring in the specification.

Claims 4, 6, 16, and 18, each of which includes the disputed term “Retinex processing unit,” describe that element as follows:

a first Retinex processing unit which performs a first Retinex process on a video input from the video input unit;

a second Retinex processing unit which performs a second Retinex process, which is different from the first Retinex process, on the video input from the video input unit;

'388 Patent at cl. 4; *see also id.* at cls. 6, 16, 18. This claim language shows that a Retinex processing unit is a device—specifically a processor—that performs a Retinex process.

The specification provides an example of such a processor:

FIG. 7 illustrates a configuration example of the first Retinex processing unit 20 including: a reflected light detection unit 150 which receives the internal video signal 12 as an input signal and detects two reflected light components 101 and 102 through the video processing based on the Retinex theory; and a reflected light control unit 180 which receives the detected two reflected light components as inputs, which adjusts the reflected light, and then which outputs the correction video signal 13 through the recomposition.

'388 Patent at 8:33-42. This supporting disclosure describes the type of structure one of skill in the art would recognize as a Retinex processing unit. This passage, along with Fig. 7, also provides detailed information on how a Retinex processing unit operates, including its input, output, and objective. *See Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1298 (Fed. Cir. 2014), overruled on other grounds by *Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (“Rather, to one of skill in the art, the ‘structure’ of computer software is understood through, for example, an outline of an algorithm, a flowchart, or a specific set of instructions or rules.”); *see also id.* at 1299 (noting how a patent’s description of a term’s “operation, including its input, output, and objective” can show a term connotes sufficient structure).

Further, courts have found similar processing unit terms connote structures, specifically processors, sufficiently to remove the term from the ambit of § 112 ¶ 6. *See, e.g., Samsung Elecs. Am., Inc. v. Prisia Eng’g Corp.*, 948 F.3d 1342, 1354 (Fed. Cir. 2020) (finding “digital processing unit” sufficiently denoted structure and did not invoke means-plus-function claiming); *Gesture*

Tech. Partners, LLC v. Huawei Device Co., No. 2:21-CV-40, 2021 WL 4760632, at *39-40 (E.D. Tex. Oct. 12, 2021) (rejecting that the term “processing unit” is a means-plus-function term in multiple patents, and finding “although ‘processing unit’ may refer to a broad class of structures, this breadth does not necessarily render the term non-structural”); *CXT Sys., Inc. v. Acad., Ltd.*, No. 2:18-CV-00171-RWS-RSP, 2019 WL 4253841, at *11 (E.D. Tex. Sept. 6, 2019) (collecting cases for the proposition that for “basic” computer-implemented functions, computers or processors are often definite structure themselves, and concluding that “[b]ased on this precedent, the Court understands that the ‘processing module for processing’ of the claims is inherently structural. As such, the presumption against applying § 112, ¶ 6 stands.”).

For the above reasons, “Retinex processing unit” is construed to have its plain and ordinary meaning, without the need for Maxell’s exemplary language.

C. “video composing unit” (’388 Patent, Claims 4, 6, 10, 16, 18)

Maxell’s Construction	TCL’s Construction
Plain and ordinary meaning, for example, a portion of one or more processors that composes a video	<p>Governed by 35 U.S.C. § 112(f)</p> <p><u>Function</u>: compose a video from a video processed by the first Retinex processing unit and a video processed by the second Retinex processing unit in accordance with a feature of the video input from the video input unit</p> <p><u>Structure</u>: None disclosed</p>

Similarly, the parties dispute whether “video composing unit,” recited in claims 4, 6, 10, 16, 18 should be interpreted as a means-plus function term, and if so, whether the term is indefinite for failing to be tied to corresponding structuring for performing the function. At the hearing, Defendants argued this term has two functions in several of the claims, and focused on an alleged

lack of structure for the function that occurs in the corresponding wherein clauses: “wherein the video composing unit changes a composition ratio between the video subjected to the first Retinex process and the video subjected to the second Retinex process in accordance with luminance information or frequency information of the video input from the video input unit.” *See* Dkt. No. 105 at 76:6-77:17.

Defendant’s argument centers on the assumption that “unit” is a nonce term and therefore “video composing unit” must be construed according to § 112 ¶ 6. For the reasons above, the Court does not endorse the broad holding that using the term “unit” necessarily requires construing the limitation in a means-plus-function format. Looking at the written description here, “video composing unit” suggests structure by stating how it operates – by composing video. The claims describe the corresponding inputs (“video processed by the [first/second] Retinex processing unit”), outputs (“composed video”), and operation (video composition). *Intell. Ventures II LLC v. BITCO Gen. Ins. Corp.*, 2016 WL 125594, at *8 (E.D. Tex. Jan. 11, 2016) (“Structure may also be provided by describing the claim limitation's operation, such as its input, output, or connections.” (citing *Apple*, 757 F.3d at 1299)).

As noted above, the specification can be informative in determining whether the disputed claim language recites sufficiently definite structure. Here, Figure 3 and the associated text provides structure suggesting a person of ordinary skill would understand the claim term to denote sufficiently definite structure:

FIG. 3 illustrates an example of a configuration of the video composing unit 26. The correction video signal 21 is magnified by “ α ” in a gain controlling unit 27, the correction video signal 23 is magnified by “ $(1-\alpha)$ ” in a gain controlling unit 28, and the both signals are subjected to an addition process in an adder 30, and then, are magnified by “ β ” in a gain controlling unit 31, so that the correction video signal 13 is obtained.

'388 Pat. at 4:58-65. And in a different embodiment, the patent explains that “[b]y controlling the α as described above, a composition ratio can be changed in accordance with the luminance level,” which addresses the second function in the wherein clause that Defendants raised at the hearing. '388 Pat. at 7:41-43.

For these reasons, this term is not subject to § 112 ¶ 6, and therefore, not indefinite for the '388 Patent's alleged failure to identify corresponding structure. The plain and ordinary meaning governs.

VII. CONCLUSION

In their April 22, 2025 Joint Claim Construction Chart, Dkt. No. 89, the parties submitted the following agreed construction, which the Court now adopts:

Term/Patent/Claim(s)	Court's Construction
“almost” ('580 Patent: Claim 11)	Plain and ordinary meaning
“separation mirror” ('580 Patent: Claims 10, 11)	Plain and ordinary meaning, for example, a part designed to pass and/or reflect different characteristics of light in a projector
“a front side of the fluorescent material” ('226 Patent: Claim 10)	The surface of the fluorescent material on the side facing the excitation light source

For the disputed terms, the Court adopts the following constructions as set forth in this opinion:

U.S. Patent 7,159,988	
“projection optical unit” / “a first projection optical unit” / “a second projection optical unit” (Claims 1, 7, 8)	Plain and ordinary meaning

U.S. Patent 8,593,580	
“light separation optic system” (Claims 1, 10, 32)	Plain and ordinary meaning
“light modulation means” (Claims 1, 9, 10, 18, 32)	<p><u>Function</u>: “making light-modulation on a respective one of the lights of the R, G and B separated, depending on a video signal”</p> <p><u>Structure</u>: “a transmission-type or a reflection-type liquid crystal panel, or a digital mirror device (DMD)”</p>
“light flux capturing means” (Claims 7, 37)	<p><u>Function</u>: “directing light”</p> <p><u>Structure</u>: “a reflection surface”</p>
U.S. Patent 9,547,226	
“an emission side of the excitation light relative to the fluorescent material” (Claim 8)	Part of the term below (i.e., “an excitation light’s exit side of the fluorescent material that faces away from the excitation light source”)
“the optical member has a curvature that is set such that a light-condensing position of the excitation light is positioned on an emission side of the excitation light relative to the fluorescent material” (Claim 8)	“the optical member has a curvature that causes a light-condensing position of the excitation light to be positioned on an excitation light’s exit side of the fluorescent material that faces away from the excitation light source”
U.S. Patent 9,565,388	
“Retinex processing unit” (Claims 4, 6, 16, 18)	Plain and ordinary meaning
“video composing unit” (Claims 4, 6, 10, 16, 18, 22)	Plain and ordinary meaning

The Court **ORDERS** each party not to refer, directly or indirectly, to its own or any other party’s claim-construction positions in the presence of the jury. Likewise, the Court **ORDERS** the

parties to refrain from mentioning any part of this opinion, other than the actual constructions adopted by the Court, in the presence of the jury. Neither party may take a position before the jury that contradicts the Court's reasoning in this opinion. Any reference to claim construction proceedings is limited to informing the jury of the position.

SIGNED this the 30th day of June, 2025.



J. Boone Baxter
UNITED STATES MAGISTRATE JUDGE